

**ABSTRACT****METHOD AND APPARATUS FOR DETERMINING SIGNATURES  
FOR CALIBRATING A COMMUNICATION STATION HAVING AN  
ANTENNA ARRAY**

- 5       A method and apparatus for estimating the downlink signature for a remote transceiver which is part of a wireless communication system that includes a main transceiver for communicating with the remote transceiver. The main transceiver includes an array of transmit antenna elements. The method uses the remote transceiver for receiving signals when the main transceiver transmits downlink calibration signals.
- 10   When the main transceiver also has a receive antenna array, the remote transceiver can transmit uplink calibration signals to the main transceiver for determining an uplink signature. The downlink and uplink signatures are used to determine a calibration function to account for differences in the apparatus chains that include the antenna elements of the arrays, and that enable downlink smart antenna processing weights to be
- 15   determined from uplink smart antenna processing weights when the main transceiver includes means for smart antenna processing according to weights.